

nective perienteric tissue, in the parenchyma of which the internal organs are lodged and fixed. Hence M. Grenacher concludes that it is necessary to separate *Gordius*, more than is usually done, both from *Mermis* and from the true Nematodes, at the same time approximating *Mermis* to the latter.—*Zeitschr. für wiss. Zoologie*, xviii. p. 322; *Bibl. Univ.* August 15, 1869, *Bull. Sci.* pp. 308–311.

On the Development of Pelobates fuscus, Wagl.

By C. VAN BAMBEKE.

The author treats of a subject which has not hitherto been investigated—the embryogeny of *Pelobates fuscus*. His history of its development commences with the ovarian egg, and closes at the period when the internal branchiæ replace the external branchiæ—that is to say, when the principal organs are sketched out. He first of all describes the process which he has followed in making his preparations. The object is to obtain sections sufficiently delicate for microscopic examination by transmitted light, this method being the only one which leads to positive results in the anatomical investigation of the various phases of embryonic development. For further details the reader must refer to the memoir.

The ovum is described, with the appearance which it presents in the ovary. The deposition of the secondary vitellus in the protoplasm of the primordial ovum takes place uniformly round the germinal vesicle, and not in the form of a nucleus; the germinal vesicle is enclosed in a cavity closely approximated to the periphery of the ovum, and has no external communication by a canal; the rupture of the germinal vesicle always precedes the quitting of the ovary by the ovum; and there is no true vitelline membrane (*Eizellmembran* of Remak). These are the chief peculiarities presented by the ovum before its extrusion.

In the upper hemisphere of the fecundated ovum a clear solid nucleus makes its appearance; this becomes the starting-point of the segmentation, which sometimes commences upon the very border of the germinal pit (*fovea germinativa* of Schultze). The circle of folds (*Faltenkranz* of the Germans) is very distinct in the ovum of *Pelobates* during the first phases of segmentation. The division into two spheres takes place in such a manner that the part still undivided, instead of being central, occupies the periphery of the ovum, and corresponds to the inferior pole.

The formation of the primitive visceral cavity results from the multiplication of the cells of the deeper layer of the dome which covers the cavity of segmentation. In consequence of this cellular proliferation, the above-mentioned layer is incurved and covers the clear hemisphere. As soon as the primitive visceral cavity has replaced the cavity of segmentation, the embryonal lamellæ are distinct. Of these there are four, namely:—

1. An external lamella (enveloping membrane).

2. A second lamella, which the author, like Prof. Stricker, regards as the true sensorial lamella.

3. A third lamella, which corresponds to the motory germinal lamella of the higher Vertebrata.

4. A fourth lamella, the analogue of the glandular or trophic lamella (*Trophisblatt* of Remak).

In *Pelobates* the primitive streak does not precede the dorsal furrow, but appears at the same time as the latter: these two parts are at first visible only in the posterior half of the dorsal region of the future embryo; but the dorsal furrow is soon completed, when its form is characteristic, and most frequently the primitive streak cannot be distinguished in its anterior half. The clear surface has an ovoid form; its anterior limit corresponds to a dark zone which shows itself at the same time as the dorsal furrow and primitive streak; this is the *cephalic crescent*, of which the subsequent modifications are very remarkable in *Pelobates*.

The microscopical examination of transparent sections shows clearly that, in *Pelobates*, the production of the dorsal furrow is effected solely at the cost of the outer lamella (enveloping membrane). This latter behaves like the sensorial lamella of the higher Vertebrata at the period of the formation of the nervous canal; only, when the dorsal furrow is closed, the tube produced by this closure is not yet the nervous canal, which is afterwards completed by the incurvation of the thick part of the sensorial lamella.

At its anterior part the thickened portion of the sensorial lamella not only gives origin to the cerebral cells and ocular vesicles, but, after the occlusion of the nervous canal, there remains, on each side, an aggregation of cells which become the origin of the auditory vesicle and of the nervous part of the olfactory organ. The latter becomes the olfactory lobule, which therefore is not, in *Pelobates*, an excrescence of the anterior cerebral cell, and only comes into contact with this gradually.

As regards the motory germinal lamella, we shall only say here that the cutaneo-dorsal laminæ are not derived from the peripheral portion of this lamella, but are produced in their place by the laminæ of the primitive vertebræ. The dorsal cord, the Wolffian bodies, and the external and internal branchiæ originate from the motory lamella.

Lastly, the author believes we may regard as the first rudiments of the kidneys two small masses of cells formed at the expense of the glandular lamella; but he has been unable to ascertain what relation there exists between these organs and the excretory ducts of the Wolffian corpuscles.—*Mém. de l'Acad. Roy. de Belgique*. Abstract communicated by the Author.

On the Systems of Capillary Vessels in the Gasteropods.

By Prof. WEDL.

The doctrines that are now generally accepted in France and elsewhere with regard to the blood-vascular system of the Mollusca